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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/088,522	03/29/2002	Francoise Vinet	220680USOPCT	2382

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EXAMINER

SPIEGLER, ALEXANDER H

ART UNIT	PAPER NUMBER
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1637

DATE MAILED: 09/28/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/088,522	VINET ET AL.	
	Examiner	Art Unit	
	Alexander H. Spiegler	1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14-53 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 14-53 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 March 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/01/02</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Status of the Application

1. This action is in response to Applicants' inquiry, filed on August 11, 2004. Currently, claims 14-53 are pending and are rejected herein. This action is made NON-FINAL.

Information Disclosure Statement

2. The information disclosure statement filed on July 1, 2002 complies with CFR 1.97, 1.98, and M.P.E.P. 609, and has been considered (see enclosed, signed PTO-1449).

Specification

3. The disclosure is objected to because of the following informalities:

A) In the Brief Description of the Figures (pages 18-19), Applicants' should supply a description of each of the Figures of Figure 4, including an individual description of Figures 4(A)-(E).

B) It is noted that Applicants' began numbering the claims at Claim 15; however, the Claims have been renumbered starting at Claim 14, since the previous Claims (Claims 1-13) were cancelled by the preliminary amendment of March 29, 2002. See 35 CFR 1.126.

C) The abstract of the disclosure is objected to because the abstract should be limited to a single paragraph. Furthermore, the abstract should not refer to "Figure 5." Correction is required. See MPEP § 608.01(b).

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 14-53 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A) Claims 14-53 are indefinite over “said nitrogenous base(s)” because it is not clear as to whether this refers to the nitrogenous base (by itself as recited in the preamble), or the nitrogenous base *of a nucleic acid* (as recited in the preamble).

B) Claims 14-53 are indefinite over “without marking by a mirage effect method” because it is not clear as to what is meant or encompassed by “marking” or a “mirage effect method.” Furthermore, the specification does not define these recitations nor describe what is encompassed by these recitations.

C) Claims 14, 17, 20, 23, 26-34, 37 are indefinite over “characterizing” because it is not clear as to what is meant or encompassed by “characterizing” a nucleic acid or nitrogenous base. Furthermore, the specification does not define this recitation nor describe what is encompassed by this recitation. For example, it is not clear as to what steps are encompassed by the recitation of “characterizing...without marking by a mirage effect method”.

D) Claims 15, 18, 21, 24, 35, 38, 40, 42, 44, 46, 48, 50, 52 are indefinite over “quantification” because it is not clear as to what is meant or encompassed by “quantifying” a nucleic acid or nitrogenous base. Furthermore, the specification does not define this recitation nor describe what is encompassed by this recitation. For example, it is not clear as to what steps are encompassed by the recitation of “quantifying...without marking by a mirage effect method”.

E) Claims 16, 19, 22, 25, 36, 39, 41, 43, 45, 47, 49, 51, 53 are indefinite over “mapping” because it is not clear as to what is meant or encompassed by “mapping” a nucleic acid or nitrogenous base. Furthermore, the specification does not define this recitation nor describe what is encompassed by this recitation. For example, it is not clear as to what steps are encompassed by the recitation of “mapping...without marking by a mirage effect method”.

F) Claims 17-19, 23-25, and 37 are indefinite over “formed *particularly* of a support” because it is not clear as to whether the biochip *is* formed of a support, is partly a support, etc. Furthermore, the claims are indefinite over “particularly including” because it is not clear if the process necessarily requires the steps following the recitation of “particularly including.” In addition, it is not clear as to what types of analysis are encompassed by the recitation of “an analysis intended to check the coupling.”

G) Claims 20-33 are indefinite over “photothermal deflection method” because it is not clear to how these claims are further limiting from Claims 14-19 (from which Claims 20-33 depend from). Claims 14-19 relate to a “mirage effect method.” On page 8, lines 15-16, the specification states, “mirage effect methods, also called photothermal methods.” Therefore, it is not clear as to whether there is a difference, and if so, what difference there is between “mirage effect methods” and “photothermal methods.”

H) Claims 26-33 are indefinite over “the image effect method” because this recitation lacks antecedent basis.

I) Claims 27-28, 20, 32, 40, 41 are indefinite over “coherent light” because it is not clear as to what is meant by this recitation. For example, it is not clear as to how “coherent” light is

distinguished from “incoherent” light. Furthermore, the specification does not define this recitation nor describe what is encompassed by this recitation.

J) Claims 34-37 are indefinite over “polarization of the nucleic acid” because it is not clear as what is meant by this recitation. Furthermore, the specification does not define this recitation nor describe what is encompassed by this recitation.

K) Claims 52-53 over “incoherent source” because it is not clear as to what is meant by this recitation. For example, it is not clear as to how an “incoherent” source is distinguished from a “coherent” source. Furthermore, the specification does not define this recitation nor describe what is encompassed by this recitation.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 14-53 are rejected under 35 U.S.C. 102(b) as being anticipated by Adelhelm et al. (SPIE (1996) 2629:325-332, cited in the IDS).

Adelhelm teaches a characterization, quantification and mapping process for a nitrogenous base, a nucleic acid or a nitrogenous base of a nucleic acid fixed on a support, the said process consisting of characterizing, quantifying and mapping the said nucleic acid or said nitrogenous base without marking by a mirage effect method. See abstract, pages 328-329 and Figures 5-6, for example. Adelhelm also teaches a process for manufacturing a nucleic acid biochip formed particularly of a support on which at least one nucleic acid synthesized in situ is

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fixed, the said process comprising at least one synthesis and analysis cycle, particularly including firstly coupling of a nitrogenous base for in situ synthesis of the said nucleic acid fixed on the supports and secondly an analysis intended to check the coupling of the said nitrogenous base, the said analysis being done using a characterization, quantification or mapping process. See pages 327-329, for example. Furthermore, Adelhelm teaches the process in which the nitrogenous base, the nucleic acid or the nitrogenous base of nucleic acid is illuminated by a pump beam originating from an excitation source, and absorption, deviation or reflection of light originating from the excitation source by nucleic acid, or by the nitrogenous base, is detected or measured using a probe beam and the image effect method is a photothermal deflection method. See pages 326-328 and Figures 1-4, for example. Adelhelm further teaches the probe and pump beams are in transverse or collinear configuration. See pages 326-328 and Figures 1-4, for example. Adelhelm also teaches the detection or measurement in a spectral range between 200-300 nm. See page 329 and Figures 5-6, for example.

Double Patenting

8. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

9. Claims 14-53 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 14-39 of copending Application No. 10/089,164 (herein referred to as '164). Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims of '164 are a species of the instant claims. This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

For example, Claims 14-16 are drawn to:

A characterization, quantification and mapping process for a nucleic acid fixed on a support, the said process consisting of characterizing, quantifying and mapping the said nucleic acid without marking by a mirage effect method (or photothermal deflection method).

Claims 14-15 of '164 are drawn to:

14. A detection method, comprising: detecting of a molecular recognition reaction between a first molecule fixed on a support and a second molecule present in a solution to be tested, without labeling the first and second molecule, in which the detection is made by a photothermal method.

15. The detection method, without labeling, of a molecular recognition reaction according to Claim 14, which is *a hybridization reaction of nucleic acids* said method comprising: fixing of the first nucleic acid molecule on a solid support, contacting of the first nucleic acid molecule fixed on the solid support with a solution to be tested suspected of containing the second nucleic acid molecule, said second molecule being capable of being hybridized with said first molecule, the contacting being carried out under conditions favorable for said hybridization, washing of the solid support to *isolate a detection sample formed from said first molecule fixed on the support and possibly said second molecule hybridized on said first molecule, and measuring the absorption of the sample by a photothermal method.*

Furthermore, Claims 18-19, 22-23, 27-33 and 36-39 of '164 are drawn to:

18. The detection method according to Claim 14 in which the photothermal method is a method of photothermal deflection in which the sample is illuminated by a pump beam and the absorption of the pump beam by a sample is detected by the refraction or the reflection of a probe beam.

19. The detection method according to Claim 15 in which the photothermal method is a method of photothermal deflection in which the sample is illuminated by a pump beam and the

absorption of the pump beam by a sample is detected by the refraction or the reflection of a probe beam.

22. The detection method according to Claim 18 in which the probe and pump beams are in a transverse configuration or in an approximately collinear configuration.

23. The detection method according to Claim 19 in which the probe and pump beams are in a transverse configuration or in an approximately collinear configuration.

27. The detection method according to Claim 18 in which the pump beam is a beam from a laser chosen from a continuous argon laser at 275 nm, a quadrupled YAG laser with a wavelength of 266 nm or a polychromatic light.

28. The detection method according to Claim 18 in which the probe beam has a wavelength that is not absorbed by the substrate nor the present molecules.

29. The detection method according to Claim 16 in which an incident beam is used, said beam being a beam from a laser chosen from a continuous argon laser at 275 nm, a quadrupled YAG laser with a wavelength of 266 nm or polychromatic light.

30. The detection method according to Claim 17, comprising in addition a step for comparing the measurement of absorption of the sample with that of a control sample.

31. The method according to Claim 14, in which hybridization of nucleic acids is detected.

32. The method according to Claim 15, in which hybridization of nucleic acids is detected.

33. The detection method according to Claim 19 in which the pump beam is chosen from a pulsed laser, a continuous intensity modulated laser or polychromatic light.

36. The detection method according to Claim 19 in which the pump beam is a beam from a laser chosen from a continuous argon laser at 275 nm, a quadrupled YAG laser with a wavelength of 266 nm or a polychromatic light.

37. The detection method according to Claim 19 in which the probe beam has a wavelength that is not absorbed by the substrate nor the present molecules.

38. The method according to Claim 24, in which hybridization of nucleic acids is detected.

39. A detection method, comprising: detecting a molecular recognition reaction between a first molecule fixed on a support and a second molecule present in a solution to be tested, without labeling said first and said second molecule, in which the detection is made by a photothermal method; wherein said molecular recognition reaction is a hybridization reaction of nucleic acids, said method comprising, fixing of the first nucleic acid molecule on a solid support; contacting of the first nucleic acid molecule fixed on the solid support with a solution to be tested suspected of containing the second nucleic acid molecule, said second molecule being capable of being hybridized with said first molecule, the contacting being carried out under conditions favorable for said hybridization; washing of the solid support to isolate a detection sample formed from said first molecule fixed on the support and possibly said second molecule hybridized on said first molecule; and measuring the absorption of the sample by a photothermal method.

Accordingly, because the claims of '164 (narrowly drawn to the characterization, quantification and mapping of a hybridization complex of nucleic acids) are a species of the instant claims (broadly drawn to the genus of nucleic acids), the instant claims are rendered obvious over the claims of '164.

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Correspondence

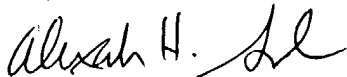
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alexander H. Spiegler whose telephone number is (571) 272-0788. The examiner can normally be reached on Monday through Friday, 7:00 AM to 3:30 PM.

If attempts to reach the examiner are unsuccessful, the primary examiner in charge of the prosecution of this case, Carla Myers, can be reached at (571) 272-0747. If attempts to reach Carla Myers are unsuccessful, the examiner's supervisor, Gary Benzion can be reached at (571) 272-0782.

Papers related to this application may be faxed to Group 1637 via the PTO Fax Center using the fax number (703) 872-9306. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

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Alexander H. Spiegler
September 23, 2004



CARLA J. MYERS
PRIMARY EXAMINER